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CASE REPORT

Primary Hyperparathyroidism and Psychosis

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THE finding of a parathyroid adenoma in a patient suffering from paranoid psychosis with depressive features, and the rapid clearing of psychic symptoms following surgery, drew our attention to the fact that only six similar cases have been reported in detail.

It is now recognized that hyperparathyroidism is more common than was formerly believed; hence a knowledge of its unusual presenting manifestations is important. A review of four large series[1-4] revealed that mental symptoms were associated with this disorder in 4.2% of 405 cases. The mental symptoms described range from vague, unexplained aches and pains, fatigue and listlessness unrelated to exertion, through marked depression and psychosis to the delirium and coma associated with acute parathyrotoxicosis. In this report a classification of the psychiatric presentations of hyperparathyroidism is suggested.

A 64-year-old woman of Italian birth was forcibly brought to the Emergency Room by her family. She had, in the course of an argument, attacked her 70-year-old husband with a stove grill and had been rather violently subdued by her family. On admission she was hostile, extremely suspicious, anxious, fixed in her paranoid delusions, and occasionally violent and unmanageable. She showed depressed facies and moderate psychomotor retardation, and expressed suicidal thoughts.

For eight months she had been increasingly abusive toward her family, suspicious of their motives, frequently berated her husband for not working and accused the neighbours of spying on her. As a result of her behaviour, two daughters still living at home had moved away. Her symptoms had improved for two months when her husband obtained part-time work, but became even more intolerable when he returned to retirement. Concurrent with her paranoid symptoms were increasing symptoms of depression: feelings of sadness, loss of energy and ambition, feelings of helplessness and hopelessness, weight loss, difficulty in sleeping, somatic preoccupation and suicidal ruminations.

Further inquiry revealed that she had had intermittent mental symptoms dating back at least 34 years. Following the birth of her sixth child in 1929 she suffered a "nervous breakdown" and was advised to have no more children. She had four more children, and following each birth went through a two-month period of accentuation of her more difficult character traits with the appearance of abusive and suspicious characteristics. Five years before admission the patient underwent a vein-stripping operation for varicosities, under spinal anesthesia. At that time she had an episode characterized by disorientation, parading nude about the house, incontinent of both urine and feces, seeing snakes in her bed, insisting that a chlorine bleach be put in the water to purify it, and reliving in hallucination her daughters' marriages and her children's births. Osteoporosis had been noted on a routine chest radiograph on that admission but it had not been felt to be of consequence.

Abnormal findings on physical examination included: bruising over the upper arms and thighs; Grade I arteriosclerotic changes in the optic fundi and a Grade II, short, systolic precordial cardiac murmur. The only abnormality found on a neurological examination was very brisk reflexes.

A chest radiograph revealed extensive osteoporosis of the bony structures with a suggestion of cystic changes. This finding led to determination of serum calcium, phosphorus and alkaline phosphatase. Repeated estimations revealed the following: serum calcium, 13, 14 and 15 mg. % (upper limit of normal: 10.5-11 mg. %); serum phosphorus, 2.3, 2.5 and 2.6 mg. % (normal: 3.5-4.2 mg. %); alkaline phosphatase level, 57 and 62 King-Armstrong units. An upper gastrointestinal series was normal. Radiographs of the hands revealed marked osteoporosis and suggestions of cystic changes. Further investigation supported the diagnosis of primary hyperparathyroidism.

Because the patient became violent and unmanageable during the course of her laboratory studies, two treatments with electroconvulsive therapy were given in an effort both to control her behaviour and to relieve her depressive symptomatology. Her depression improved to a large extent but her paranoid symptoms remained unchanged.

Two weeks after admission surgical exploration of the neck was performed. A fairly large (5 x 3.4 x 1.6 cm.) parathyroid adenoma at the left lower pole of the thyroid was found and excised. Three normal parathyroid glands were demonstrated.

Within 48 hours of this operation the patient's psychotic symptomatology improved markedly. However, it was disappointing to note that she remained rather cantankerous and unpleasant to her family for about two weeks following the operation. With the improvement in her psychotic symptoms, her family, who had rejected her, rallied to her aid and she gradually became quite amiable. On follow-up three months after the operation the patient was reported to be more cheerful and amiable than she had been in years, living with her husband in the family house and getting along well with him.

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DISCUSSION

The first systematic collection of cases of hyperparathyroidism showing mental symptoms was that reported in 1942 by Eitinger,[1] who found such symptoms in seven of 50 patients. These and other cases described in subsequent publications most often manifested confusional psychoses, the presentation of which was characterized by a change in consciousness ranging from drowsiness to stupor, usually of a few days' or weeks' duration, preceded for several months by lethargy, weakness, thirst and anorexia, and perhaps for longer by more characteristic features of the disease. Serum calcium levels in such cases are usually above 16 mg. %,[5-9] a feature noted in dogs with a similar syndrome produced by administration of parathyroid extract.[10] It should be noted, however, that mental symptomatology does not bear a direct relationship to the serum calcium level; very high levels have been associated with minimal symptoms and signs, as in the case of a patient cited by Hanes[8] who was "cheerful and uncomplaining" in spite of a serum calcium level of 20 mg. %.

Of greater pertinence to this report are descriptions of psychoses in the absence of extremely high levels of serum calcium. Six such cases were found in the literature.[4, 11-14] Those described in sufficient detail show remarkable similarity to the case described in this report. All presented as psychoses with a clear sensorium, characterized by severe depression and often paranoid delusions, together with irritable, boisterous or violent behaviour. The maximum serum calcium level reported was 15.4 mg. %, an interesting contrast to the range of 16-22 mg. % reported in patients with confusional psychoses (Table I). In the cases in which results of treatment were reported, there was a uniform, prompt and sustained dissolution of psychotic manifestations.

A third type of presentation not specifically commented upon but apparent in case reports might be termed the pseudoneurotic form. In this variant there is a long history of complaints such as fatigue, lassitude, weakness, poor appetite and constipation, together with minor alterations of behaviour characterized by irritability and loss of drive. This constellation of non-specific complaints together with personality changes may easily lead to a mistaken diagnosis of neurosis.

TABLE I.—SCATTERGRAM SHOWING SERUM CALCIUM LEVELS IN CASES OF CONFUSIONAL PSYCHOSIS (O) AND OF PSYCHOSIS WITH CLEAR SENSORIUM (X), ASSOCIATED WITH HYPERPARATHYROIDISM

Serum calcium (mg. %)			
20.0			
		0	
19.0		0	
	0		
18.0		0	
	0	0	
17.0			0
	0		
16.0			
	X		0
15.0			
		0	
14.0	X	X	X
		0	
13.0			X
12.0			
11.0	X		

Each of the patterns described above presents difficult diagnostic problems. It is evident that the diagnosis of hyperparathyroidism should be considered in unexplained cases of progressive confusional psychosis. Diagnosis in the other variants will probably continue to depend upon accidental findings suggestive of metabolic disease. However, awareness of these modes of presentation may lead to more frequent and early diagnosis.

SUMMARY

A case of primary hyperparathyroidism presenting as a functional psychosis is reported. A review of the literature indicates that six similar cases have been described. Mental symptoms occurred in 4.2% of 405 cases of primary hyperparathyroidism. It is suggested that these symptoms fall into three patterns: a toxic psychosis, a pseudoneurotic form, and a paranoid psychosis with depressive features, the latter being the rarest of the three.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

THE FEE OUGHT TO BE MORE

Dr. Primrose had given his first anæsthetic, before he studied medicine, for Dr. Stewart. He also said that in the Old Country the surgeon shared the responsibility. This has a great advantage when we have to deal with unskilled anæsthetists. Instruments of precision tend to make the administration more dangerous. Such methods are complicated and the apparatus not suitable for being carried about.

Dr. Hunter claimed that the important point was mainly that the careful attention of the anæsthetist is necessary. The fee ought to be more than $5.00.

Dr. Stewart, in reply, stated that the most of his work was in private houses, and that he would recommend the anæsthetic the anæsthetist is most familiar with. Chloroform should not be given too slowly. Lawrie's time was seven minutes to one ounce.—Discussion of a paper by Dr. J. Stewart, *Canad. Med. Ass. J.*, 4: 1064, 1914.